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Prevalence of Periodontal Diseases in Zagreb Population, Croatia, 14 Years Ago and Today

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A B S T R A C T

The aim of this study was to assess prevalence of periodontal diseases within Zagreb adult population in 2000. The sample comprised of 412 examinees of both sexes and all age groups. World Health Organization (WHO) methodology and Community Periodontal Index (CPI), (1997) were used. The data gained was statistically assorted and compared with the data from previously conducted research in 1986. Results showed relatively high prevalence of periodontal diseases. No healthy periodontium was recorded in the 45-and-above age group. Shallow periodontal pockets was registered in 12% of nineteen-year-olds, whereas this symptom was very evident in 45–54 age group (45.7%) and in older than 65 (48.2%). Over 90% of participants had insufficient oral hygiene and 80% required initial periodontal therapy. Approximately 20% needed complex periodontal treatment. Comparison of this data with the previous 1986 research showed improvement of periodontal status in up-to-44 age group due to more healthy persons and more subjects with the initial stages of disease. The possible reason for periodontal health improvement in the last 14 years, evident specially in younger age groups, were the effects of large preventive program measures conducted on schoolchildren in Croatia in 1980--ties and terminated in 1990-ties when the war in Croatia started. Following studies are needed to monitor whether deterioration in oral health will occur regarding to absence of organized preventive programs since 1990-ties.

Key words: *periodontal epidemiology, Community Periodontal Index, treatment need, Zagreb, Croatia*

Introduction

The main purpose of periodontal epidemiological studies is to influence onto periodontal prevention and care with improving general periodontal status in particular population. The collected data is important to promote health and to improve prophylactic measures which are important for public health policy. For effective follow up of population periodontal status epidemiological studies should be comparable in longer period and therefore able to present periodontal status in the same condition and according to the same periodontal assessment protocol in different time among all age and social groups.

Aurer-Koželj[1] in 1986 and Potočki-Tukša[2] in 1991 assessed frequency of periodontal diseases within general Croatian population. In the five years period, improvement in the periodontal health was registered. The frequencies of initial stages (calculus and gingivitis) were in increase while periodontitis was decreasing. According to Plančak in Zagreb region in 1986 gingivitis was found with entire school age population, deep pockets were found even within twenty-year-olds with increase in older age groups[3]. The author highlighted the necessity of better organization of periodontal preventive care[3]. Comparing with the results of the research conducted in 1986 Špalj stressed improvement in the periodontal health of rural population of Croatia in 1998/9[4]. Similar studies were conducted all over the world with different findings among various populations and different age groups [5–10].

This epidemiological study is follow up the one conducted in 1986 which, by using the same population, criteria and WHO protocol would have the aim of gaining representative information about prevalence of periodontal diseases and treatment requirements of Zagreb adult population. Comparison of these two researches would give the opportunity to determine improvement,

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stagnation, or deterioration in periodontal status of the population examined in a decade of preventive measures program (1986) and then after a decade of termination of preventive program (2000).

Materials and Methods

Data were collected in suburban Zagreb areas and city of Zagreb. The sample comprised of 412 examinees in 2000 and 2,096 examinees in 1986 of both sexes with different age (above 19 years) and socioeconomic background. In 1986 there were additional 1080 examinees in age groups 6, 9, 12 and 15, but those age groups were not examined in 2000. The assessed population was classified in 7 age groups (19, 20–29, 30–34, 35–44, 45–54, 55–64 and 65 and older). Periodontal examination was conducted with the CPI-E periodontal probe and dental mirror with standard dental unit illumination. The data were recorded according to World Health Organization (WHO) protocol[11]. Periodontal examination was performed by two examiners and both inter and intra-examiner reproducibility was above 0,75. Inter and intra-examiner reproducibility was calculated by multiple reexamination of the same group of people using the Kappa statistics according to WHO protocol[11]. Dentition was divided into 6 sextants – upper right lateral, upper frontal, upper left lateral, lower left lateral, lower frontal and lower right lateral sextant. The highest index value was registered on the reference teeth for each sextant: 17/16, 11, 26/27, 36/37, 41, 46/47. Community Periodontal Index (CPI, 1997) methodology was used with the scale:

0 – healthy periodontium,

1 – bleeding during probing,

2 – supra/subgingival calculus and/or iatrogenic irritations of marginal ginigiva,

3 – shallow periodontal pocket 4–5 mm,

4 – deep periodontal pocket 6mm and more.

Statistical significance of differences between the data of this study and previous data from 1986 (by using the same population, criteria and WHO forms) was checked by χ^2, Mann-Whitney and t-tests with 95% of probability.

Results

Table 1 shows prevalence of periodontal disease in this study (2000) and study conducted in 1986. There was no finding of healthy periodontium in the age above 45 years. Sixteen percent of examinees at the age of 19 had healthy periodontium, as well as 6% in the age group 35–44. Sulcus bleeding was the most frequent finding in the age group 20–29 whereas calculus in the age of 19 (52%). Shallow periodontal pockets were rarely registered in the age of 19 (12%) while highly frequent in age group 44–45 (45.7%), and over 65 (48.2%). Deep periodontal pockets were not found in age of 19. Its frequency progressively increases with age up to 64 with occurrence of 37.3%.

The results in Table 2 show that number of healthy sextants reduces proportionally with age. Therefore, in the age of 19 on average 1.96 sextants were healthy while in age group 55–56 only 0.27. Sulcus bleeding sextants occurred within all age groups with highest frequency in age of 30–34 (4.74 sextants). Occurrence of calculus sextants increased with age. Progression of destruction of deep parts of periodontium was manifested particularly in the age group 35–44 with 3.46 sextants. Deep periodontal pockets were registered in all age groups but affected only 0.24 sextants in the age of 19 years and with the highest frequency in the age group 35–44 (1.89 sextants).

Over 94% of participants in this study had insufficient oral hygiene. Sixty four percent of examinees in the age group of 19 required initial periodontal therapy. The requirement for complex periodontal treatment progressively increases from age 20 to age group 55–64.

A significant increase in level of periodontal diseases and age was registered. Between the age of 19 and 20–29 prevalence of deep pockets has increased for 7% ($p< 0.01$). Between the age of 20–29 and 30–34 prevalence of gingivitis has decreased for 13% while occurrence of shallow pockets increased for 15% ($p<0.05$). Decrease of 6% was registered for healthy periodontium and gingivitis, while 17% increase of calculus and deep periodontal pockets between age groups 35–44 and 45–54 ($p<0.05$). Deterioration of periodontal health with age is more evident if we compare it with the three referent age groups

TABLE 1
PREVALENCE OF PERIODONTAL DISEASES IN ZAGREB REGION IN YEARS 1986 AND 2000

	HP		BP		CP		P1P		P2P	
Year	1986	2000	1986	2000	1986	2000	1986	2000	1986	2000
19	0	16**	14.14	20	62.26	52	23.58	12	0	0
20–29	0	15.38**	3.41	23.08**	51.82	38.46	38.41	15.38**	6.36	7.69
30–34	0	6.66**	0.27	10**	34.42	40	54.74	30**	10.56	13.33
35–44	0	5.88*	0.14	5.88*	24.14	41.18*	58.98	32.35**	16.73	14.70
45–54	0	0	0.29	0	14.41	24	64.55	45.71	20.75	30.29
55–64	0	0	0	0	18.75	20.71	50	42	31.25	37.29
>65	0	0	0	0	12.19	17.31	31.70	48.20	56.10	34.50*

*$p<0.05$; **$p<0.01$, HP – percentage of persons with healthy sextants, BP – percentage of persons with bleeding sextants, CP – percentage of persons with calculus, P1P – percentage of persons with shallow pockets, P2P – percentage of persons with deep pockets, HP+BP+CP+P1P+P2P=100%

TABLE 2
SEVERITY OF PERIODONTAL DISEASES IN ZAGREB REGION IN YEARS 1986 AND 2000

	HK		BK		CK		P1K		P2K		X	
Year	1986	2000	1986	2000	1986	2000	1986	2000	1986	2000	1986	2000
19	0.40	1.96**	5.60	4.04	3.30	0**	0	1.44**	0.50	0.24*	0	0
20–29	0.10	1.27**	5.70	4.73	4.90	0**	0.46	2.75**	1.30	0.75*	0.20	0
30–34	0	1.26**	5.50	4.74	5.20	0.10**	0.80	3.25**	2.10	1.21*	0.50	0*
35–44	0	0.83**	5.10	4.41	4.90	0.30**	0.88	3.46**	2.60	1.89	0.90	0.76
45–54	0	0.71*	4.90	3.89	4.80	0.40**	1.82	3.06*	2.90	1.83	1.00	1.40
55–64	0	0.27	4.50	2.66*	4.50	0.50**	2.24	2.23	2.70	1.86	1.50	3.07*
>65	0	0	2.50	1.89	2.40	0.80**	2.07	1.72	1.90	1.06*	3.50	4.11

*$p<0.05$; **$p<0.01$, HK – mean number of healthy sextants per person, BK – cumulative mean number of bleeding sextants per person including sextants with calculus, shallow and deep pockets, CK – cumulative mean number of sextants with calculus per person including shallow and deep pockets, P1K – cumulative mean number of sextants with deep and shallow pockets per person, P2K – mean number of sextants with only deep pockets per person, X – mean number of excluded sextants per person, HK+BK+X=6

as suggested by WHO. Between the ages 19 and 35–34 prevalence of healthy and persons with gingivitis is reduced from 10 to 17% ($p<0.05$), while shallow and deep pockets increased from 14 to 20% ($p<0.01$). Prevalence of healthy and gingivitis are reduced almost by 6% in the age group 35–44 and over 65 ($p<0.05$), while calculus and deep pockets are increased from 24 to 30% ($p<0.01$).

When compared the results with 1986 study it is evident that periodontal health improved in age groups up to 44 years. Overall, in this study it was found significantly more persons with healthy periodontium and more healthy sextants per person as well as reduction of number of sextants with deep pockets ($p<0.05$).

Discussion

When findings of the assessment of periodontal diseases of Zagreb population of nineteen-year-olds are compared with those of WHO Global Oral Data Bank it could be noted that similar values have countries like Germany (1985 and 1986), Great Britain (1991), France 1985), Syria (1989), New Zeeland (1981), former Yugo - slavia (1987)[21]. For the age group 35–44 the data regarding the prevalence are in concordance with those of France (1985), Italy (1983) Egypt (1990), Holland (1983), Great Britain (1985), and Morocco (1986)[12]. Prevalence of periodontal disease for age group of 65 and older is similar to the data from Slovenia, where registered prevalence of calculus totals 12%, prevalence of shallow pockets is 45% and deep pockets 43% while healthy periodontium and gingivitis were not found. These findings significantly differ from those from the Global Oral Data Bank. In Japan, for example, for the population over 65 years prevalence of shallow pockets is 53% while prevalence of deep pockets is 10%. In Germany, prevalence of calculus is 60% and deep pockets 6%. In Korea, 20% of examinees of this age have healthy periodontium. During the ten year period (1985–1995) in Zimbabwe an improvement in periodontal health was registered. Population groups under 45 years required only 4% of complex periodontal treatment[13]. Neighbouring Slovenia also registers oral health improvement in year 1993 when compared with 1987 study[14]. Healthy periodontium was not found with institutionalized population over 60 years in India. In most cases this population has deep periodontal pockets (32.29%) that are in concordance with findings in our population[15]. Shallow pockets are the main problem in elderly in Japan as well as in Zagreb[16]. Deep pockets were found in 45% of Portuguese adults aged between 30–39[17]. There is higher percentage of health, and less gingivitis and periodontitis in population of France and Romania[6,7].

No index designed for epidemiological purposes can be substituted for the careful process of clinical evaluation, but CPI has been proven as a simple and quick screening tool[18]. Its criteria satisfy validity and relevance, although some suggestions are given for further refinements[19]. The prevalence and severity of both persons and sextants recorded with bleeding or with calculus was generally overestimated among the younger age groups when examinations were based only on the CPI selection of index teeth instead of all teeth, whereas the prevalence and severity of advanced periodontal disease forms (shallow and deep pockets) was underestimated among elderly subjects[20–24]. Although there is possibility of underestimation of periodontal disease as only reference teeth are scored with CPI, this index is the most widely used and epidemiological data from many countries can be easily compared. The CPI methodology has provided a simple yet effective method for measuring and monitoring the magnitude, prevalence and severity of periodontal diseases throughout the world[25]. In Japan CPI has been implemented for screening purposes into basic dental epidemiology, dental public health and dental clinical practice[26].

In conclusion, this study has shown that health status of periodontium of Zagreb population in the last 14 years period has improved. The number of individuals with healthy periodontium and patients with initial stages of disease increased, while the number of those with periodontitis decreased when compared to the previous study

(1986). The possible reason for periodontal health improvement in the last 14 years, evident specially in younger age groups, were the effects of large preventive program measures conducted on schoolchildren in Croatia in 1980-ties when ambulances for children and preventive dentistry in schools or near them were established, and when preventive measures were conducted in schools (systematic examinations, fluoridation and oral hygiene education). Elementary school students from 1986 were in age groups 19–29 in 2000 and their parents in 30–44 age groups. Unfortunately preventive program was terminated in the beginning of 1990-ties when the war in Croatia started. Following studies are needed to monitor whether deterioration in oral health will occur regarding to absence of organized preventive programs since 1990-ties.

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UČESTALOST PARODONTNIH BOLESTI U ZAGREBAČKOJ POPULACIJI, PRIJE 14 GODINA I DANAS

SAŽETAK

Svrha ovog istraživanja bilo je utvrditi učestalost parodontnih bolesti u zagrebačkoj populaciji 2000. godine. Uzorak se sastojao od 412 ispitanika oba spola i svih dobnih skupina. Korištene su metode Svjetske zdravstvene organizacije i Parodontni indeks zajednice (1997). Dobiveni podaci uspoređeni su s podacima iz istraživanja provedenog 1986. godine. Rezultati pokazuju relativno visoku učestalost parodontnih bolesti. U dobnim skupinama starijim od 45 godina nije utvrđeno prisustvo zdravog potpornog sustava zuba. Plitki parodontni džepovi utvrđeni su kod 12% devetnaestogodišnjaka, kod 45,7% ispitanika u dobi između 44 i 54 godina te kod 48,2% ispitanika starijih od 65 godina života. Kod više od 90% ispitanika utvrđena je nedostatna oralna higijena, a kod 80% ispitanika uočena je potreba za inicijalnom parodontološkom terapijom. Kompleksna parodontološka terapija potrebna je kod 20% ispitanika. Usporedbom podataka s nalazima iz 1986. godine utvrđeno je poboljšanje parodontnog statusa ispitanika u dobi do 44. godine života s većom učestalosti osoba sa zdravim parodontom te početnim oblicima parodontne bolesti. Mogući razlog za poboljšanje parodontnog zdravlja u posljednjih 14 godina, vidljivi posebice u mlađoj populaciji, su efekti mjera velikog preventivnog programa provedenog u školaraca u Hrvatskoj 80-tih godina prošlog stoljeća, a ukinutog početkom 90-tih kada je počeo rat u Hrvatskoj. Potrebno je daljnje praćenje populacije da bi se vidjelo hoće li doći do pogoršanja oralnog zdravlja, budući da od 90-tih ne postoje organizirani preventivni programi.